

The Impact of Gender, Age, Educational Level, And Place of Residence On Algerian University EFL Students' Preferences of Online Versus Face-To-Face Learning

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ABSTRACT: *The rapid integration of online learning into higher education, accelerated by the COVID-19 pandemic, has made understanding student modality preferences essential for effective pedagogical design. This is particularly important in contexts like Algeria, where digital transition intersects with unique sociocultural and infrastructural dynamics. This quantitative study investigates the impact of four key demographic variables: gender, age, educational level, and place of residence, on Algerian university EFL students' preferences for online (OL) versus face-to-face (F2F) learning. Grounded in Self-Determination Theory (SDT) and the Community of Inquiry (CoI) framework, the research interprets preferences through the lenses of psychological needs (autonomy, competence, relatedness) and perceived educational presence (social, teaching, cognitive). Data were collected via a structured questionnaire from 268 EFL students across Algerian universities and analyzed using chi-square tests, ANOVA, and correlation analysis. The results reveal significant influences for three variables: gender ($p=.047$), with males leaning toward OL (prioritizing autonomy) and females toward F2F (valuing relatedness); age ($p=.013$), showing older students' greater openness to OL for flexibility; and educational level ($r=.269, p<.01$), indicating that advanced students prefer more autonomous, OL-integrated formats. Contrary to expectations, place of residence showed no significant effect ($p=.434$), suggesting that perceived learning quality and psychological needs may outweigh geographic barriers in this context. The study concludes that students' modality preferences are not merely logistical but are deeply tied to how different learning environments fulfill core psychological needs and establish meaningful educational presence. These findings offer evidence-based guidance for Algerian educators and policymakers, advocating for differentiated, phased blended learning models that are pedagogically responsive and designed to support autonomy, relatedness, and a strong community of inquiry across both digital and traditional classrooms.*

KEYWORDS: Online Learning; Face-to-Face Learning; Blended Learning; Self-Determination Theory; Community of Inquiry; EFL students; Demographic Factors; Higher Education

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1. Introduction

The rapid expansion of digital technologies has profoundly reshaped the educational scene (Alenezi, 2023), particularly following the global shift toward online (OL) learning prompted by the COVID-19 pandemic. In recent years, universities worldwide have increasingly integrated OL platforms into their educational systems (Williamson, 2024), enabling students to access resources, interact with instructors, and engage in collaborative learning beyond the confines of traditional classrooms (Nyathi & Sisimayi, 2024). However, this transition has not been uniform across all regions and demographics.

In Algeria, as in many countries, higher education has rapidly adapted to the rise of digital technologies and the challenges posed by the pandemic (Al-Qadri et al., 2024). The Ministry of Higher Education's measures, including university closures and the transition to online instruction, demonstrate the country's commitment to these changes (Ministerial Order No. 633, August 26, 2020; Decree No. 055, January 21, 2021). This shift has led to a growing emphasis on blended learning, combining OL and face-to-face (F2F) instruction (Zakharova et al., 2024), with concerted efforts to formally integrate it into educational programs (Laifa et al., 2024). As the sector undergoes transformation, understanding the factors that influence students' preferences for OL versus F2F learning becomes fundamental. Variables such as gender, age, educational level, and place of residence are likely to shape these preferences, reflecting broader sociocultural and infrastructural dynamics within Algeria.

Despite the growing importance of OL education, there remains limited understanding of how demographic factors influence Algerian university EFL students' preferences between OL and F2F learning. The Algerian higher education system, like many others, faces unique challenges related to access, digital literacy, and the urban-rural divide. Variables such as gender and age-related preferences, associated with varying educational levels and place of residence may all play a role in shaping students' perceptions and engagement with OL platforms. However, these factors have not been comprehensively explored within the Algerian context, creating a gap in knowledge that hinders the ability of educational policymakers to design inclusive and effective learning strategies that address the diverse needs of the student population.

While some studies have explored the influence of demographic and individual factors on learning preferences in various global contexts (Tibi et al., 2022; Wang et al., 2025), there remains a significant lack of research specifically addressing Algerian university EFL students. Existing literature primarily focuses on the adoption of e-learning platforms such as Moodle in Algerian universities, revealing challenges like network issues and lack of familiarity, which adversely affect students' attitudes toward these platforms (Ghounane & Rabahi, 2023). The study by Laifa et al. (2023) offers valuable insights into Algerian students' satisfaction and future preferences regarding blended learning; however, it does not examine the same variables as the current study, which specifically investigates the impact of gender, age, educational level, and place of residence on Algerian university EFL students' preferences for OL versus F2F learning.

Moreover, a substantial gap exists in investigating the combined effects of these demographic variables within Algeria's unique sociocultural and educational context. Addressing this gap is essential for developing educational strategies that bridge the digital divide and promote equitable access for all Algerian students, irrespective of their background. Therefore, this study aims to fill this gap by examining how gender, age, educational level, and place of residence influence preferences for OL versus F2F learning among Algerian university EFL students.

1.1 Research Questions and Hypotheses

The present research study is guided by the following key questions:

1. How does gender influence Algerian university EFL students' preferences for online versus face-to-face learning?
2. What is the impact of age on EFL students' learning preferences in Algerian universities?
3. Does the educational level of EFL students affect their preference for online or face-to-face learning?
4. How does place of residence (urban versus rural) shape EFL students' preferences for online versus face-to-face learning?

Based on these research questions, the following hypotheses were formulated:

- **H1:** Gender has a significant effect on Algerian university EFL students' preferences for online versus face-to-face learning.
- **H2:** Age significantly influences the learning preferences of Algerian university EFL students.
- **H3:** Educational level has a significant impact on EFL students' preferences for online versus face-to-face learning.
- **H4:** Place of residence significantly affects the learning preferences of Algerian university EFL students.

2. Literature Review

While OL has long been part of the educational scene for some time, the sudden shift to emergency remote teaching in 2020, prompted by the COVID-19 pandemic, caught educational systems, parents, and students off guard, creating numerous challenges (Alhazmi, 2023). The widespread school closures caused by the pandemic made teaching exceptionally difficult for educators worldwide (UNESCO, 2023). The transition from traditional to OL marked a significant shift in education, requiring adaptations in teaching methods and the adoption of new learning strategies (Aristovnik et al., 2023). At the same time, it offered an opportunity to challenge conventional approaches and explore innovative ways to reconsider remote learning in supporting students. With limited opportunities for in-person instruction, many teachers were forced to transition rapidly to fully OL courses. Despite these obstacles, teachers have worked diligently to develop novel strategies to engage students and maintain their motivation.

OL has grown significantly due to advancements in technology and its flexibility in accommodating diverse learning needs (Ahern et al., 2024; Lin & Wang, 2024). It offers significant flexibility, allowing learners to access educational content at their convenience and to balance studies with other responsibilities such as work and family. This flexibility is particularly beneficial for non-traditional adult learners and those who cannot attend F2F classes (Ahern et al., 2024). Online education is inclusive, accommodating participants of all ages, genders, education levels, and cultural backgrounds, and providing opportunities for learners with accessibility needs (Rizvi et al., 2019). The ability to repeatedly access course materials and self-pace learning further supports diverse learning preferences and needs (Hwang et al., 2021). Despite its flexibility and accessibility, challenges remain, including concerns about the quality of online education, technical issues, social isolation, lack of interactivity and lower retention rates compared to traditional learning environments (Ahern et al., 2024).

F2F learning remains a valued traditional method, where students and teachers interact directly in physical classrooms, fostering active interaction, lively guidance, and immediate feedback between them, which promotes student engagement and positively affects learning outcomes (Liu, 2023; Minadzi & Segbenya, 2024). Students benefit from cooperative learning and peer support, with F2F environments facilitating group discussions and collaborative problem-solving, especially for hands-on and operational courses (Wisneski et al., 2017). F2F learning helps eliminate feelings of isolation by fostering social connections among classmates and faculty members (Minadzi & Segbenya, 2024). However, F2F learning can face challenges such as scheduling conflicts, commuting, and the cost of organizing programs can hinder participation, especially for those with occupational or distance restrictions (Imran et al., 2023). In-person classes are less flexible, may restrict diversity, and cannot always accommodate large groups or those who are harder to reach (Minadzi & Segbenya, 2024).

Blended learning has been introduced as a thoughtful transitional educational approach that combines synchronous F2F classroom instruction with asynchronous OL components, integrating both methods to create a cohesive learning experience (Xu, 2024). This model uses the strengths of in-person interaction and digital resources, allowing learners to benefit from the flexibility and autonomy of OL while maintaining the immediacy and engagement of traditional classroom settings (Deng et al., 2022). By merging these two formats, blended learning aims to optimize educational outcomes and adapt to diverse learner needs (Elgohary et al., 2022). This model allows for parts of traditional classroom teaching to be replaced or supplemented by online activities, such as virtual courses or live online lectures, while maintaining opportunities for in-person engagement and hands-on practice (Shah et al., 2024). By blending these formats, educational institutions aim to capitalize on the flexibility and autonomy of OL alongside the immediacy and interpersonal connection of F2F sessions, facilitating a smoother transition between conventional and digital learning environments (Elgohary et al., 2022).

Blended learning, which combines OL and F2F elements, offers an adaptable alternative that enhances critical thinking and learning outcomes through synchronous and asynchronous activities (Suryono et al., 2023).

2.1 Previous Recent Studies Based on the Study Hypotheses

Numerous studies have explored EFL students' preferences of OL versus F2F learning; however, they have not specifically addressed the impact of factors such as gender, age, educational level, and place of residence on language students' preferences for OL versus F2F, particularly within the Algerian context.

2.1.1 The Impact of Gender on Student's preferences of OL versus F2F learning

Numerous studies have consistently demonstrated that gender plays a significant role in shaping students' preferences for OL versus F2F learning environments. For example, Idrizi et al. (2023) observed that female students generally perform better in traditional F2F classes, whereas male students tend to excel slightly more in OL contexts. Supporting this, AIBlooshi et al. (2023) noted that female students generally prefer F2F learning, with several studies reporting that a higher proportion of females (ranging from 55.8% to 86.2%) favor traditional classroom settings over online modalities. Male students show a greater inclination towards online learning, with 6.0% of males preferring OL compared to 4.3% for F2F, and over 85% of males citing convenience as a key factor for their preference (AIBlooshi et al., 2023).

Further evidence from Yu (2021) reveals that over 80% of female students prefer consistent, in-person learning methods and are less inclined towards OL, whereas more than 85% of males appreciate the convenience that OL provides. Mannes (2023) similarly reported distinct gender differences in training preferences: females favor F2F settings, place greater value on instructor interaction, and prioritize effort as a critical success factor, while males are more motivated by OL environments and emphasize prior knowledge as key to success (Khan & Khan, 2024).

Rahmat et al. (2021) found that females generally lean toward F2F learning because they value collaboration and communication, whereas males appreciate the flexibility and independence of OL education. Anderson and Haddad (2019) also highlighted female students' preference for traditional in-person learning compared to males' inclination for OL formats. Collectively, these findings underscore the influence of gender on students' learning choices.

This influence is statistically significant, as demonstrated by a p-value of 0.047, consistent with studies by Elsaid et al. (2021) and Alghamdi et al. (2020), which confirm that gender markedly affects students' experiences and preferences. Notably, the preference of female students for F2F learning reflects a tendency toward social interaction (Addae et al., 2025), which can be linked to gender-based social norms shaping how each gender perceives and engages with different learning approaches.

Convenience and flexibility are major reasons for male students' preference for OL, while females often cite a desire for consistent learning methods and express discomfort with online approaches (AIBlooshi et al., 2023; Yu, 2021).

2.1.2 The Impact of Age on Student's preferences of OL versus F2F learning

Recent research has extensively documented how age influences students' preferences for OL and face-to-face (F2F) learning. Studies consistently show that younger students tend to favor OL courses more than older students. Spencer and Temple (2021), for example, distinguish traditional students from nontraditional ones based on age, defining the latter as those aged 25 and above.

Mature students often face significant time constraints as they juggle professional, family, and personal responsibilities, which can affect their engagement with OL. Despite the flexibility and convenience that online formats offer, older adults generally prefer F2F learning environments. This preference stems partly from technological anxiety, difficulties maintaining online engagement, and a belief that face-to-face settings had better enhance their focus and engagement (Addae et al., 2025; Young & Norgard, 2006).

Additionally, generational technology skills play a significant role. Those born from 1997 onward, referred to as "*Generation Z*" and "*Generation Alpha*," exhibit greater technological fluency and adaptability compared to older generations like Millennials. This generational gap contributes to younger students' increased comfort with, and preference for OL platforms (Young & Norgard, 2006).

Although some sources emphasize adult learners' preference for OL due to its flexibility, others highlight mature students' inclination toward F2F formats, driven by technological apprehension and a desire for direct social interaction (Addae et al., 2025; Özöztürk et al., 2023; Raymond et al., 2016). Factors such as comfort with technology and the ability to concentrate significantly affect these preferences. Moreover, age-related impacts are complex, with variability present within older student groups regarding attitudes toward OL (Young & Norgard, 2006; Özöztürk et al., 2023).

Overall, the influence of age on preferences for OL versus F2F learning is intricate, shaped by technological familiarity, time management challenges, and perceived interaction quality. Educational approaches should acknowledge these age-related differences to more effectively cater to the diverse needs of learners.

2.1.3 The impact of Educational Level on Student's preferences of online versus F2F learning

Research has consistently shown that educational level significantly shapes students' preferences for OL versus F2F learning. Braun (2008) found that graduate students generally report high satisfaction with online academic courses, with flexibility being a primary motivator for enrollment, often outweighing the importance of instructor and peer interaction. In contrast, first-year students tend to prefer F2F lectures and tutorials, possibly due to a lack of the learning skills needed to benefit from online formats (Owston et al., 2013). As students advance in their studies and become more independent, their attitudes toward blended learning become more positive, and they are less reliant on F2F instruction as their main source of knowledge. Graduate and mature part-time students, in particular, are more likely to view blended learning as appropriate for meeting their educational needs and expectations compared to traditional undergraduates (Owston et al., 2013). This preference may be further influenced by factors such as insufficient orientation or time to adjust to online modalities, which can decrease satisfaction and preference among less experienced students (Li et al., 2023; Owston et al., 2013).

Further evidence suggests that academic background influences students' perceptions of learning modes. Tempelaar et al. (2013) found that prior mastery of the subject, shaped by different secondary school systems, affects students' use of adaptive online tutorials in blended environments. Kuzma et al. (2015) surveyed upper-level business students and found that convenience and the unavailability of in-person courses were key reasons for choosing online learning. Similarly, Aristovnik et al.'s (2017) findings revealed that students' attitudes toward e-courses increase with their year of study, indicating a strong link between educational level and preference for e-learning. Woolley et al. (2020) and Yu (2021) both concluded that individuals with higher educational attainment are more likely to favor OL, with postgraduates citing greater freedom for self-regulated learning and flexibility. Raturi et al. (2011) also found that graduate students place greater value on interactions with instructors and engagement with course content in F2F than on peer interactions in online courses than undergraduates.

Recent studies further support these findings. Dong (2024) demonstrated that course modality significantly affects student satisfaction, with online classes reporting the lowest satisfaction in terms of academic challenge and overall quality. Mehta et al. (2024) observed that more undergraduates prefer in-person learning, while postgraduates show a greater preference for mixed online modes. Bou-Hamad and El Danaoui (2024) noted that graduate students strongly prefer hybrid (66%) and F2F (27%) learning over fully online options, attributing this to the flexibility required to balance academic and professional commitments.

Overall, the evidence suggests that students' educational level is a crucial factor in shaping their preferences for online, blended, or F2F learning, with higher levels of education correlating with increased openness to flexible and self-directed learning environments.

2.1.4 The Impact of Place of Residence on Students' preferences of online versus F2F learning

The place of residence plays a significant role in shaping students' preferences between OL and F2F formats. Various studies have documented notable differences based on whether students live in urban or rural areas, which impact their access to resources, comfort with technology, and overall learning experiences.

For instance, Tarr et al. (2015) investigated demographic variables like commuting distance and how they influenced students' choices between F2F sessions and recorded lectures. Their study showed that students who traveled two or more hours were much more likely to rely on recorded lectures regularly, favoring online alternatives due to convenience.

Further emphasizing infrastructural challenges, Muthuprasad et al. (2021) identified broadband connectivity issues in rural regions as a significant barrier to OL adoption. Their research also examined students' preferences regarding OL attributes, noting a widespread preference for smartphone use and recorded classes supplemented with quizzes for greater effectiveness.

Similarly, Mariya et al. (2022) examined students' acceptance and satisfaction with e-learning during the COVID-19 pandemic in India, highlighting the influence of both place of residence and gender. Their findings revealed that residence significantly affected students' psychological stress levels, acceptance of, and satisfaction with e-learning, with rural students incurring higher expenses on OL resources. This suggests that rural students may face additional burdens despite embracing online formats.

Urban students, particularly those living in cities with populations exceeding 50,000, generally report more positive experiences with online education compared to peers in smaller or rural areas. This disparity is largely due to better digital infrastructure and access to interactive online resources such as immediate evaluation questionnaires, animations, and interactive exercises (Montaña-Blasco & Mohammadi, 2023). In contrast, students from smaller communities often encounter unreliable internet and less conducive home environments for online study, which leads to a stronger preference for face-to-face instruction (Tuckel & Pok-Carabalona, 2023).

Moreover, differences in digital literacy contribute to these preferences. Urban students tend to possess more advanced digital skills supported by better access to technology and training, making online learning more comfortable and effective for them (Montaña-Blasco & Mohammadi, 2023). Meanwhile, rural students frequently favor F2F learning due to limited internet access and fewer digital tools, which undermine the effectiveness of online education in those contexts (Tuckel & Pok-Carabalona, 2023).

Several studies underscore flexibility and location convenience as key factors influencing student preferences toward online learning. OL is often chosen for its convenience, flexible scheduling, and ease of access, particularly by students who face significant travel distances to campus (Paechter & Maier, 2010; Li et al., 2025). The ability to study from home or other locations represents a critical advantage for those living far from educational institutions (Li et al., 2025). Conversely, F2F courses require students' physical presence at fixed times and places, demanding higher commitments and preparation (Keis et al., 2017).

Interestingly, even among students equipped with the necessary technology to participate in online courses, many still express a preference for F2F instruction. This suggests that factors beyond convenience, such as the structure, engagement, and interpersonal dynamics inherent in on-site teaching, strongly influence their choices (Keis et al., 2017).

Practical concerns also shape students' decisions between OL and F2F modalities. These include the need to commute to campus, balancing family and work responsibilities, and students' attitudes toward technology use (Harrington & Loffredo, 2010). For some, avoiding commutes and the ability to learn at their own pace make online learning particularly appealing (Li et al., 2025). Nevertheless, the interpersonal interactions and more structured learning environment offered by face-to-face courses remain highly valued and often preferred (Gumede et al., 2025; Wisneski et al., 2017).

Taken together, these findings demonstrate that place of residence and the associated need for flexibility are crucial determinants of students' preferences between online and face-to-face learning, interacting with other practical and personal factors to shape these choices.

2.2 Theoretical Framework

To provide a robust foundation for investigating the factors influencing learning modality preferences, this study is anchored in two complementary theoretical frameworks: *Self-Determination Theory* (SDT) and the *Community of Inquiry* (CoI) model. These frameworks offer distinct yet interconnected lenses for understanding the psychological needs and experiential dimensions that underpin student choices between OL and F2F learning environments.

2.2.1 Self-Determination Theory (SDT)

Self-Determination Theory (SDT; Ryan & Deci, 2000) posits that optimal motivation, engagement, and well-being are driven by the satisfaction of three innate psychological needs: autonomy (the need to feel in control of one's own learning decisions), competence (the need to feel effective in mastering tasks), and relatedness (the need to feel meaningfully connected to instructors and peers). This study applies SDT to hypothesize that students' preferences for a specific learning modality are fundamentally linked to their perception of which environment best fulfills these core needs. For instance, a preference for OL may be driven by a higher valuation of autonomy (e.g., flexibility and self-pacing) and competence (supported by repeatable digital resources), whereas a preference for F2F learning may stem from a stronger need for relatedness (direct social interaction) and competence bolstered by immediate interpersonal feedback. Furthermore, the demographic variables under investigation: gender, age, educational level, and place of residence, are viewed as moderating factors that influence the salience and prioritization of these psychological needs (Venkatesh et al., 2016; Yu, 2021).

2.2.2 Community of Inquiry (CoI) Framework

The Community of Inquiry (CoI) framework (Garrison et al., 2000) provides a model for understanding the essential components of a meaningful educational experience, particularly in blended and online contexts, by identifying three interdependent "presences": social presence (the degree to which learners perceive themselves and others as "real" persons within the learning community, enabling open communication and group cohesion), teaching presence (the design, facilitation, and direction of cognitive and social processes to achieve learning outcomes), and cognitive presence (the extent to which learners can construct and confirm meaning through sustained reflection and discourse).

In this study, the CoI framework is used to analyze how students perceive the capacity of OL versus F2F modalities to establish these presences. For example, a preference for F2F learning may indicate a perception of stronger social and teaching presence, whereas a preference for OL might correlate with a

greater valuing of certain aspects of cognitive presence, such as opportunities for asynchronous, reflective engagement, or specific elements of teaching presence, such as structured access to curated digital content. The demographic factors under investigation are examined as variables that may influence students' access to, or valuation of, these different presences (Ahern et al., 2024; Montaña-Blasco & Mohammadi, 2023).

2.2.3 Synthesis of Theoretical Lenses

Together, SDT and CoI offer a powerful, multi-dimensional framework for this investigation. SDT illuminates the intrinsic *motivational drivers* (needs for autonomy, competence, relatedness) behind preferences, while CoI provides a structure for evaluating the perceived *educational experience* (social, teaching, cognitive presence) offered by each modality. This dual perspective allows for a richer interpretation of how demographic characteristics shape the complex interplay between students' psychological needs and their evaluation of a learning environment's interactive qualities.

3. Methodology

3.1 Research Design

This study adopts a quantitative research design to thoroughly explore and analyze the impact of gender, age, educational level, and place of residence on the preferences of Algerian university EFL students for OL versus F2F learning. A survey questionnaire was used to gather data from a sample of 268 EFL students across various Algerian universities. The design allows for the analysis of relationships between the independent variables (gender, age, educational level, and place of residence) and the dependent variable (learning preferences). This approach ensures an empirical foundation for examining the factors influencing s EFL tudents' preferences.

3.2 Sample

A total of 268 students from various higher education institutions across Algeria participated in the survey. The questionnaire was distributed through diverse OL platforms, including EFL students' Facebook groups, WhatsApp, academic forums, and mailing lists. Potential participants were invited to take part in the survey by sharing the google forms' link on these platforms, encouraging widespread engagement.

Table (1): Descriptive Statistics for Respondents' Demographic Characteristics

Demographic Variables		Frequency (n)	Percentage (%)
Gender	Male	55	20.5%
	Female	213	79.5%
Age	18-22	197	73.5%
	22-25	52	19.4%
	25-30	3	01.1%
	30 or more	16	6%
Place of residence during class	On-campus residency	78	29.1%
	Off-campus	190	70.9%
Educational level	First Year License	104	38.8%
	Second Year License	31	11.6%
	Third Year License	61	22.8%
	Master One	40	14.9%
	Master Two	32	11.9%

Table 1 provides a detailed overview of the demographic characteristics of the study's respondents. The data reveal that the majority of participants were female (79.5%), with males comprising only 20.5% of the sample. Most respondents fell within the age group of 18–22 years (73.5%), followed by 22–25 years (19.4%), with smaller groups aged 25–30 (1.1%) and 30 or older (6%). Regarding place of residence, most participants (70.9%) lived off-campus, while 29.1% resided on-campus. In terms of educational level, the largest group consisted of First Year License EFL students (38.8%), followed by Third Year License EFL students (22.8%), Master One EFL students (14.9%), Master Two EFL students (11.9%), and Second Year License EFL students (11.6%). These details provide a comprehensive demographic profile of the sample, offering valuable context for interpreting the study's findings.

3.3 Research Instrument

Data were collected using a structured questionnaire specifically designed for this study. The questionnaire comprised two sections: (1) demographic information, including gender, age, educational level, and place of residence, and (2) a series of items assessing EFL students' preferences for OL versus F2F learning. The second section employed a 5-point Likert scale, ranging from “strongly prefer face-to-face learning” to “strongly prefer online learning”, to quantify EFL students' attitudes and preferences toward the two learning modalities. The questionnaire was distributed online to ensure broad accessibility and reduce potential biases in data collection.

3.4 Validity and Reliability of Data Collection Tools

To ensure the validity of the research instrument, the questionnaire was reviewed by two teachers from the Department of English and Literature at Batna 2 University, whose recommendations enhanced the clarity and relevance of its items. A pilot test involving 30 students was subsequently conducted to assess comprehensibility and appropriateness, leading to minor refinements.

The reliability of the data collection tool was assessed using Cronbach's alpha to evaluate internal consistency. The overall Cronbach's alpha for the preference-related items was 0.87, indicating high reliability and confirmed that the questionnaire items effectively captured the underlying constructs of the study.

5. Analysis and Interpretation of Findings

5.1 Gender Impact Hypothesis

Null Hypothesis (H0): Gender has no impact on preferences for online versus F2F learning.

Alternative Hypothesis (H1): Gender has a significant effect on Algerian university EFL students' preferences for online versus face-to-face learning.

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	18.529 ^a	10	.047
Likelihood Ratio	19.585	10	.033
Linear-by-Linear Association	4.091	1	.043
N of Valid Cases	268		

The chi-square test of independence was used to analyze the influence of gender on Algerian university students' preferences for OL compared to F2F learning. The Pearson Chi-Square test yielded a value of 18.529 with 10 degrees of freedom and a *p-value* of 0.047, which is below the commonly accepted significance level of 0.05. This indicates that the null hypothesis (H0), stating that gender has no impact on preferences for OL versus F2F learning, can be rejected. Therefore, the alternative hypothesis (H1) that gender significantly impacts students' learning mode preferences is accepted.

The likelihood ratio test also supports this conclusion, with a *p-value* of 0.033, which is below the 0.05 threshold, reinforcing the rejection of the null hypothesis. Additionally, the linear-by-linear association value of 4.091, with a significance level of 0.043, suggests a linear relationship between gender and learning preferences. This further confirms that gender influences whether students prefer OL or F2F learning environments.

5.2 Age Effect Hypothesis

Null Hypothesis (H0): Age does not significantly influence the learning preferences of Algerian university EFL students.

Alternative Hypothesis (H2): Age significantly influences the learning preferences of Algerian university EFL students.

ANOVA

Attitudes towards online and F2F learning

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.784	3	.261	3.632	.013
Within Groups	18.991	264	.072		
Total	19.775	267			

An analysis of variance (ANOVA) was conducted to examine the impact of age on Algerian university students' attitudes toward OL and F2F learning. The results showed a statistically significant difference among age groups ($F(3, 264) = 3.632, p = .013$), indicating that students' attitudes toward learning methods vary with age. Average attitude scores ranged from 1.53 for the 18–22 age group to 1.93 for the 25–30 group, suggesting that preferences may become more distinct as students grow older.

However, the small sample size in the 25–30 bracket calls for caution in interpreting these results. These findings allow rejection of the null hypothesis (H0), confirming that age significantly affects students' perceptions of the challenges and benefits of both OL and F2F learning environments. The significant F-value highlights notable differences in how age groups perceive the advantages and difficulties of each learning mode.

The between-group sum of squares value (0.784) compared to the within-group sum of squares (18.991) indicates that, although differences between age groups are statistically significant, a substantial amount of variation in attitudes toward learning modes exists within each age group. This suggests that while age is an important factor, other individual differences also contribute to shaping learning preferences and experiences.

5.3 Educational Level Correlation Hypothesis

Null Hypothesis (H0): Educational level has no significant impact on EFL students' preferences for online versus face-to-face learning.

Alternative Hypothesis (H3): Educational level has a significant impact on EFL students' preferences for online versus face-to-face learning.

Correlations

		Preference	Educational level
Preference	Pearson Correlation	1	.269**
	Sig. (2-tailed)		.000
	N	268	268
Educational level	Pearson Correlation	.269**	1
	Sig. (2-tailed)	.000	
	N	268	268

** . Correlation is significant at the 0.01 level (2-tailed).

A Pearson correlation coefficient was calculated to examine the relationship between students' learning method preferences and their educational level. The analysis revealed a positive association, with a correlation coefficient of $r(266) = 0.269$ and a significance level of $p < 0.01$. This suggests that as students progress in their education, their preferences for certain learning modalities tend to change. This finding supports the alternative hypothesis (H3) that educational attainment is correlated with the effectiveness of different learning approaches. A correlation of 0.269 is generally considered a weak to moderate positive relationship, indicating that while there is a connection, it is not strong, and other factors likely play a substantial role in shaping students' learning preferences.

5.4 Residence Influence Hypothesis

Null Hypothesis (H0): Place of residence does not significantly affect the learning preferences of Algerian university EFL students.

Alternative Hypothesis (H4): Place of residence significantly affects the learning preferences of Algerian university EFL students.

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.078 ^a	10	.434
Likelihood Ratio	10.348	10	.410
Linear-by-Linear Association	1.504	1	.220
N of Valid Cases	268		

A chi-square test of independence was conducted to examine the impact of residential location on Algerian university students' preferences for OL versus F2F modalities. The Pearson Chi-Square value of 10.078 with 10 degrees of freedom resulted in a significance level of 0.434, which exceeds the common threshold of 0.05. Similarly, the likelihood ratio and linear-by-linear association tests yielded p-values of 0.410 and 0.220, respectively, both above 0.05. These results indicate no statistically significant effect of residential location on students' preferences for OL versus F2F learning or their academic outcomes. Since all p-values are greater than 0.05, we fail to reject the null hypothesis (H0) and conclude that place of residence does not significantly influence learning method preferences or outcomes in this sample of Algerian university students.

6. Discussion and Theoretical Interpretation of Findings

This study investigated the influence of gender, age, educational level, and place of residence on Algerian university EFL students' preferences for online (OL) versus face-to-face (F2F) learning. Grounded in *Self-Determination Theory* (SDT) and *the Community of Inquiry* (CoI) frameworks, the findings are discussed not only in relation to prior empirical studies but also through the dual lenses of psychological needs and perceived educational presence. This theoretical integration provides a deeper and better understanding of the motivational and experiential drivers behind the observed demographic patterns.

6.1 Gender and Learning Preferences: Autonomy vs. Relatedness

The results confirm that gender significantly influences modality preferences ($p=0.047$), supporting H1. This finding is consistent with a substantial body of international research, which suggests that gender plays a role in shaping learning modality choices. For instance, Idrizi et al. (2023) and AIBlooshi et al. (2023) reported that female students tend to prefer F2F environments due to greater value placed on social interaction, collaboration, and structured guidance, while male students are more inclined toward OL for its flexibility and convenience. Similarly, Yu (2021) and Mannes (2023) highlighted that males are more motivated by self-paced online formats, whereas females prioritize interpersonal engagement and consistent instructional presence.

From an SDT perspective, the male students' inclination toward OL may reflect a higher prioritization of autonomy, the need for flexibility, self-pacing, and control over the learning process, and competence built through independent interaction with digital resources. Conversely, the stronger female preference for F2F learning appears closely tied to a greater need for relatedness, fulfilled through direct social interaction and immediate interpersonal feedback, and perhaps a form of competence that is socially validated.

Through the CoI lens, this gender divide can be interpreted as a difference in the valuation of core *presences*. Female students may perceive F2F environments as offering stronger social presence (authentic peer/instructor connection) and teaching presence (immediate guidance and structured facilitation). Male students, while possibly acknowledging these presences, may find that OL adequately supports their cognitive presence (through asynchronous reflection and curated content access) while offering the scheduling autonomy they value. These preferences are likely further shaped by sociocultural norms in Algeria regarding communication styles and technology engagement.

6.2 Age and Learning Preferences: Evolving Needs and Digital Fluency

The significant effect of age on preferences ($p=0.013$), supporting H2, reveals a complex interaction between life stage and perceived learning environment quality. This result aligns with studies such as Addae et al. (2025) and Young & Norgard (2006), which suggest that younger learners, despite being digital natives, may still rely on traditional classroom structures for academic socialization and support.

SDT helps explain this dynamic: younger students (18–22 years), often in the early stages of academic socialization, may still rely on the structured relatedness and external regulation of F2F settings to build foundational competence. In contrast, older students (25+ years), who typically juggle work and family responsibilities, may prioritize autonomy above all, making the flexibility of OL more appealing despite potential challenges with relatedness.

The CoI framework adds another layer. Younger digital natives, while technologically fluent, may still associate high-quality social and teaching presence primarily with physical classrooms. Older learners, despite potential technological anxiety, might develop a greater appreciation for the cognitive presence enabled by OL's asynchronous, reviewable nature, especially if they perceive teaching presence as being effectively executed through well-organized digital materials. The non-significant finding for the oldest age groups should be interpreted cautiously due to small sample sizes but suggests that age-related preferences are not monolithic and may be moderated by individual differences in digital literacy and self-efficacy.

6.3 Educational Level and Learning Preferences: Growth in Autonomy and Cognitive Presence

The positive, albeit modest, correlation between educational level and preference for OL ($r=0.269$, $p<0.01$) supports H3 and is powerfully explained by both theoretical frameworks. According to SDT, as students progress academically, they develop greater self-regulation and intrinsic motivation. Their psychological need for autonomy becomes more pronounced, making the self-directed nature of OL increasingly attractive. Concurrently, their sense of competence becomes more internally anchored, relying less on continuous external validation from F2F instructors. This trend resonates with

findings from Aristovnik et al. (2017), who observed that attitudes toward e-learning improve with year of study, and Owston et al. (2013), who noted that graduate students value the flexibility and self-regulation afforded by online components. Similarly, Bou-Hamad & El Danaoui (2024) reported that graduate students strongly prefer hybrid models, balancing OL convenience with F2F engagement.

From a CoI perspective, advanced students have likely mastered the skills needed to engage deeply with cognitive presence in online settings, conducting sustained inquiry and reflection independently. They may also become more critical consumers of teaching presence, valuing efficient access to curated resources over synchronous lecturing. This theoretical alignment is consistent with findings that graduate students prefer blended or hybrid models (Bou-Hamad & El Danaoui, 2024), which strategically balance OL's autonomy-supporting features with the relatedness-rich elements of F2F interaction.

6.4 Place of Residence and Learning Preferences: Contextualizing Access and Presence

Contrary to expectations, place of residence did not significantly influence learning preferences in this sample ($p=0.434$), leading to the rejection of H4. This finding contrasts with several international studies, such as Muthuprasad et al. (2021) and Tarr et al. (2015), which highlight how rural students face connectivity challenges and often prefer F2F learning, while urban students benefit from better digital infrastructure and show greater OL acceptance.

The CoI framework suggests that if core *presences* are effectively established, their impact can transcend location. For instance, strong teaching presence (clear design, consistent facilitation) and basic social presence (regular communication) in an OL course may mitigate the disadvantages typically associated with rural settings. The null result implies that, in this Algerian sample, students' evaluations of these presences were not systematically different based on residence.

SDT offers a complementary explanation: the fundamental psychological needs for autonomy, competence, and relatedness are universal. If OL platforms in Algeria are perceived as reasonably accessible and effective at fulfilling these needs (e.g., providing autonomy through mobile learning, fostering competence via user-friendly interfaces), then geographic location may become a less salient moderator than individual motivation or specific course design. This finding may also reflect successful national policy efforts to reduce the digital divide, allowing psychological and experiential factors to outweigh infrastructural constraints in shaping preferences.

7. Conclusion and Implications

This study set out to investigate how gender, age, educational level, and place of residence influence Algerian university EFL students' preferences for online (OL) versus face-to-face (F2F) learning. Grounded in *Self-Determination Theory* (SDT) and the *Community of Inquiry* (CoI) framework, the analysis has revealed that these demographic variables are not merely descriptive categories but are linked to deeper differences in psychological needs and perceptions of educational presence, which in turn shape modality preferences.

7.1 Theoretical and Empirical Conclusion

Empirically, the study confirms that gender, age, and educational level are significant predictors of learning modality preferences among Algerian EFL students, while place of residence did not emerge as a significant factor in this context. Theoretically, these findings can be meaningfully interpreted as follows:

Gender differences reflect a divergence in the prioritization of SDT's core needs: male students' inclination toward OL aligns with a higher valuation of *autonomy* and *competence* through self-paced digital interaction, whereas female students' preference for F2F corresponds to a stronger need for *relatedness* and socially embedded *competence*. Through the CoI lens, this suggests that instructional design must account for gendered perceptions of *social* and *teaching presence*.

Age influences preferences in ways that intersect with life stage and developmental autonomy. Younger learners may rely on the *relatedness* and structure of F2F environments, while older students increasingly seek the *autonomy* afforded by OL, even as they navigate challenges in *social presence* and digital fluency.

Educational level demonstrates a clear progression: as students advance, their growing need for *autonomy* and their enhanced ability to engage in *cognitive presence* make them more open to OL and blended formats. This shift underscores the importance of aligning instructional mode with learners' evolving self-regulation capabilities.

Place of residence, contrary to expectations, did not significantly affect preferences. This suggests that in the Algerian context, factors such as widespread mobile internet access, effective course design (strong *teaching presence*), and the universal nature of psychological needs may have mitigated traditional urban-rural divides. This finding challenges deterministic assumptions about infrastructure and highlights the role of resilient instructional design in bridging access gaps.

7.2 Practical and Pedagogical Implications

These conclusions carry several actionable implications for educators, curriculum designers, and policymakers in Algeria and similar contexts:

1. **Adopt a Differentiated, Needs-Based Approach:** Instructional design should not adopt a one-size-fits-all model. Instead, it should be flexible enough to accommodate varying needs for *autonomy* (e.g., through self-paced modules), *relatedness* (e.g., through structured peer interaction), and *competence* (e.g., through multi-format feedback).
2. **Develop Phased Blended Learning Models:** Given the correlation between educational level and OL preference, universities could implement phased integration of blended learning. First-year students might benefit from a higher proportion of F2F sessions to build community and academic skills, while graduate courses could lean more heavily on OL components to support autonomy and advanced inquiry.
3. **Design for Presence in Both Modalities:** To address gender and age-related preferences, course designers should intentionally cultivate all three CoI presences regardless of delivery mode. For OL, this means creating opportunities for meaningful interaction (*social presence*), clear and consistent facilitation (*teaching presence*), and reflective, applied tasks (*cognitive presence*). In F2F settings, leveraging technology to extend *cognitive presence* beyond the classroom could enhance engagement for autonomy-seeking learners.

4. **Invest in Digital Pedagogy, Not Just Digital Infrastructure:** The non-significance of residence suggests that *how* technology is used may be as important as *whether* it is available. Professional development for instructors should focus on digital pedagogy, how to design inclusive, presence-rich online experiences, rather than solely on technical tool mastery.
5. **Policy for Inclusivity and Flexibility:** Higher education policies should support flexible, hybrid program structures that allow students to choose modalities based on their personal circumstances and psychological needs. This is especially important for non-traditional, older, or working students whose need for *autonomy* is high.

In conclusion, this study moves beyond documenting *what* preferences exist to offer a theoretically grounded explanation of *why* they exist. By applying SDT and CoI, it becomes clear that students' choices between OL and F2F are not merely logistical but are deeply rooted in their psychological needs and their perception of how well each modality supports meaningful learning. For Algerian higher education, and indeed for any system undergoing digital transition, the priority should be to design learning experiences that are not only technologically robust but also psychologically and pedagogically responsive to the diverse, evolving needs of the student population.

7. Limitations and Future Research

While this study provides valuable insights into the demographic and theoretical underpinnings of learning modality preferences among Algerian EFL students, several limitations should be acknowledged. First, this research is limited by its cross-sectional design, a sample skewed toward younger females, and reliance on self-reported data, constraints common in exploratory educational research (Creswell & Creswell, 2018; Podsakoff et al., 2003). Consequently, future research could address these gaps by employing mixed methods to explore the qualitative dimensions of preference formation, thereby enriching the statistical findings with contextual depth (Johnson & Onwuegbuzie, 2004). Second, the sample composition was skewed, with a notable overrepresentation of female (79.5%) and younger (73.5% aged 18–22) students, which may limit the generalizability of findings across all Algerian EFL demographics. Third, examining the role of digital literacy, socioeconomic status, and institutional support as critical mediating variables would provide a better understanding of the mechanisms behind learning preferences (Venkatesh et al., 2016). Finally, the operationalization of “place of residence” as on-campus versus off-campus, while practical, may not fully capture the infrastructural and sociocultural differences between urban and rural settings that the literature often highlights.

To address these limitations and extend the current findings, future research should pursue several key directions, beginning with the adoption of longitudinal and mixed-methods designs to track the evolution of preferences over time and explore the underlying motivations through qualitative inquiry. Additionally, studies should strive for more representative and comparative sampling across gender, age, and educational stages, including cross-contextual comparisons between Algerian institutions and other regional systems to distinguish culturally specific from universal factors. Research should also move beyond self-report data by incorporating objective behavioral and outcome measures, such as academic performance and digital engagement metrics, to assess the real-world impact of modality preferences.

Furthermore, building on the theoretical framework, investigations should empirically examine potential mediating and moderating variables, including digital literacy, self-regulated learning skills, instructional quality, and socioeconomic status, to clarify the mechanisms linking demographics to preferences. Finally, refining the measurement of geographic and contextual factors with more granular indicators of residence, internet reliability, and study environment would provide a deeper understanding of the role of setting. By addressing these avenues, future research can develop a more comprehensive, dynamic, and actionable model of how and why students choose their learning environments, ultimately informing more responsive, equitable, and effective educational systems in Algeria and beyond.

In conclusion, despite its limitations, this study contributes meaningfully to a deeper understanding of the factors influencing learning modality preferences among Algerian university EFL students. It offers evidence-based insights that can inform curriculum design, pedagogical strategies, and policy initiatives aimed at optimizing blended learning systems in Algeria and similar educational contexts.

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